VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS)

ERODE – 12

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. Information Technology

B.Sc .,IT 2016-2017 onwards

Course Contents, Scheme of Examinations, Credits and

Syllabus

(for students admitted during 2016-2017 and onwards)

DEPARTMENT OF COMPUTER SCIENCE

B. Sc., Information Technology

Question Paper Pattern

CORE, ALLIED AND ELECTIVE PAPERS

Duration: 3.00 hrs   **Marks: 75**

Section – A   **(10 × 1 = 10 marks)**

Multiple Choice Questions - 5 (One from each unit)   (Q. No 1 – 5)

Fill in the blanks / True or false - 5 (One from each unit)   (Q. No 6 – 10)

Section – B   **(5 × 5 = 25 marks)**

Answer all the Questions   (Either or pattern)

One Question from each unit   (Q. No 11 – 15)

Section – C   **(5 × 8 = 40 marks)**

Answer **five** out of **eight** Questions

At least **One** Question from each unit   (Q. No 16-23)

SKILL BASED SUBJECTS

Five Questions out of **Eight**   **(5 × 15 = 75 marks)**

SELF LEARNING PAPERS AND NON MAJOR ELECTIVE

B.Sc .,IT 2016-2017 onwards

Five Questions out of **Eight**   **(5 ×20 = 100 marks)**

<table>
<tr><td colspan="11" align="center">Course Content and Scheme of Examinations (CBCS Pattern)</td></tr>
<tr><td colspan="11" align="center">Semester I</td></tr>
<tr>
<td rowspan="2">Part</td>
<td rowspan="2">Study Component</td>
<td rowspan="2">Subject Code</td>
<td rowspan="2">Title of the Paper</td>
<td rowspan="2">Inst. Hrs./ Week</td>
<td rowspan="2">Exam. Dur. Hrs.</td>
<td colspan="3" align="center">Max. Marks</td>
<td rowspan="2">Credits</td>
</tr>
<tr><td>CIA</td><td>ESE</td><td>Total</td></tr>
<tr>
<td>I</td><td>Language I</td><td>15TAMU101/ 14HINU101/</td><td>Tamil / Hindi</td><td>6</td><td>3</td><td>25</td><td>75</td><td>100</td><td>3</td>
</tr>
<tr>
<td>II</td><td>Language II</td><td>13ENHU101</td><td>English</td><td>6</td><td>3</td><td>25</td><td>75</td><td>100</td><td>3</td>
</tr>
<tr>
<td rowspan="5">III</td><td rowspan="2">Core</td><td>15ITUC101/ 15CTUC101</td><td>Data Structures and C Programming</td><td>5</td><td>3</td><td>25</td><td>75</td><td>100</td><td>4</td>
</tr>
<tr>
<td>11ITUCP01/ 11CTUCP01</td><td>Data Structures using C Lab</td><td>5</td><td>3</td><td>40</td><td>60</td><td>100</td><td>3</td>
</tr>
<tr>
<td>Allied I</td><td>11CAUA101 / 11ITUA101 / 08CTUA101</td><td>Mathematics- I (Computer Oriented Numerical Methods and Statistics)</td><td>6</td><td>3</td><td>25</td><td>75</td><td>100</td><td>5</td>
</tr>
<tr>
<td>IV</td><td>Foundation Course</td><td>09FOCU1ES</td><td>Environmental Studies</td><td>2</td><td>3</td><td>-</td><td>100</td><td>100</td><td>2</td>
</tr>
<tr>
<td colspan="8" align="right">Total</td><td>600</td><td>20</td>
</tr>
<tr><td colspan="11" align="center">Semester II</td></tr>
<tr>
<td>I</td><td>Language I</td><td>15TAMU202 / 14HINU202</td><td>Tamil / Hindi</td><td>6</td><td>3</td><td>25</td><td>75</td><td>100</td><td>3</td>
</tr>
<tr>
<td>II</td><td>Language II</td><td>13ENHU202</td><td>English</td><td>6</td><td>3</td><td>25</td><td>75</td><td>100</td><td>3</td>
</tr>
<tr>
<td rowspan="4">III</td><td rowspan="3">Core</td><td>15ITUC202</td><td>Computer Organization and Architecture</td><td>4</td><td>3</td><td>25</td><td>75</td><td>100</td><td>4</td>
</tr>
<tr>
<td>15ITUC203</td><td>Object Oriented Programming with C++</td><td>4</td><td>3</td><td>25</td><td>75</td><td>100</td><td>4</td>
</tr>
<tr>
<td>15ITUCP02</td><td>C++ Programming Lab</td><td>3</td><td>3</td><td>40</td><td>60</td><td>100</td><td>1</td>
</tr>
<tr>
<td>Allied II</td><td>11ITUA202</td><td>Mathematics- II (Mathematical Foundations for Computer Science)</td><td>5</td><td>3</td><td>25</td><td>75</td><td>100</td><td>5</td>
</tr>
<tr>
<td>IV</td><td>Value Education</td><td>14VEDU2HR</td><td>Value Education and Human rights</td><td>2</td><td>3</td><td>-</td><td>100</td><td>100</td><td>2</td>
</tr>
<tr>
<td colspan="8" align="right">Total</td><td>700</td><td>22</td>
</tr>
</table>

B.Sc .,IT 2016-2017 onwards

Part	Study Component	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	CIA	ESE	Total	Credits
Semester III									
III	Core	15ITUC304	Java and Network Programming	5	3	25	75	100	4
		15ITUC305	Principles of Data Communication and Network	5	3	25	75	100	4
		11CSUC511 / 08CAUC511 / 15ITUC306	Software Engineering	5	3	25	75	100	4
		09ITUCP03	Java and Network Programming Lab	5	3	40	60	100	3
	Allied III	11ITUA303/ 15CTUA303	Microprocessor and its Architecture	5	3	25	75	100	5
IV	Skill Based Subject I			3	3	40	60	100	3
	Basic Tamil I			2	-	100	-	100	2
	Advanced Tamil I				3	25	75		
	Non Major Elective I				3	-	100		
						Total		700	25
Semester IV									
III	Core	11ITUC407/ 11CTUC306	Operating System	5	3	25	75	100	4
		15ITUC408/ 15CTUC510	PC Hardware and Troubleshooting	5	3	25	75	100	4
		15CAUC409 / 15ITUC409/ 15CTUC613	Client / Server Computing	5	3	25	75	100	4
		08ITUCP04/ 08CTUCP05	PC Hardware and Troubleshooting Lab	5	3	40	60	100	3
	Allied IV	15ITUA404	Software Project Management	5	3	25	75	100	5
IV	Skill Based Subject II	13CSUS402/ 13CAUS402/ 13ITUS402/ 13CTUS402	Multiskill Development Paper	3	1*	40	60	100	3
	Basic Tamil II			2	-	100	-	100	2
	Advanced Tamil II				3	25	75		
	Non Major Elective II				3	-	100		
						Total		700	25

* Online Examination

B.Sc .,IT 2016-2017 onwards

Semester V									
Part	Study Component	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	Max. Marks			Credits
						CIA	ESE	Total	
III	Core	08ITUC510 / 11CTUC408	GUI Design Tools	6	3	25	75	100	4
		16CSUC407/ 16CAUC407/ 16ITUC511/ 16CTUC304	Relational Database Management Systems	5	3	25	75	100	4
		15CSUC613/ 15CAUE622/ 15ITUC512	Software Testing	5	3	25	75	100	4
		16ITUCP05/ 11CTUCP04	GUI Design Lab	5	3	40	60	100	3
	Elective I	15CAUA404/ 15ITUE511	Enterprise Resource Planning	6	3	25	75	100	5
		11ITUE521	Network Security and Administration						
		15CSUE531/ 15CAUE521/ 15ITUE531/ 15CTUE521	Big Data Analytics						
IV	Skill Based Subject III			3	3	40	60	100	3
							Total	600	23
Semester VI									
III	Core	08ITUC613	ASP.NET	5	3	25	75	100	4
		08ITUC614	Computer Graphics and Multimedia	5	3	25	75	100	4
		08ITUCP06	Computer Graphics and Multimedia Lab	5	3	40	60	100	3
		09ITUC6PV	Project **	6	-	-	100	100	5
	Elective II	15CSUE622/ 15CAUE632/ 15ITUE612/ 15CTUE622	Internet of Things	6	3	25	75	100	5
		08ITUE622	Soft Computing						
		09ITUE632/ 11CTUE612	Mobile Computing						
IV	Skill Based Subject IV			3	3	40	60	100	3
V	Extension Activity		NSS/NCC/ Physical Education/ YRC/Green Society/EDP/CCC	-	-	-	-	100	1
							Total	700	25
						Total (I - VI Semesters)		4000	140

** Project - 80% Viva- 20% - Both Internal and External

B.Sc .,IT 2016-2017 onwards

SKILL BASED SUBJECTS		
S. No.	**Subject Code**	**Title of the Paper**
1	11CSUSP01 / 11CAUSP01 / 11ITUSP01 / 11CTUSP01	Database Management through Access - Lab (Cafeteria System)
2	13CSUSP02 / 13CAUSP02 / 13ITUSP02 / 13CTUSP02	Multiskill Development Paper
3	11CSUSP03 / 11CAUSP03 / 11ITUSP03 / 11CTUSP03	Image Editing Tool - Lab (Photoshop) (Cafeteria System)
4	11CSUSP04 / 11CAUSP04 / 11ITUSP04 / 11CTUSP04	DTP Design Tools - Lab (Pagemaker & Coreldraw) (Cafeteria System)
NON-MAJOR ELECTIVES		
1	14TMLU301	Basic Tamil *
	14TMLU402	
2	14ADTU301	Advanced Tamil **
	14ADTU402	
3	11CSUNP01 / 11CAUNP01 / 11ITUNP01 / 11CTUNP01	Data Processing through Excel - Lab
	11CSUNP02 / 11CAUNP02 / 11ITUNP02 / 11CTUNP02	Web Designing - Lab (Dreamweaver)

* For students whose Part I in Secondary Education is not Tamil.   **** For students whose Part I in Higher Secondary Education is not Tamil.**

		SELF LEANING PAPERS (Optional)			
S.No.	Subject Code	Title of the Paper	Exam. Dur. Hrs.	Max. Marks	Credits
1	14ITUSL03	Green Computing	3	100	5
2	13AUGSL05	General Awareness -online examination	1*	100	5
3	14CSUSL15	Python	1**	100	5
4	14CSUSL25	PHP and MYSQL	1**	100	5

* Online Examination

** Online Examination - Spoken Tutorial - IIT Bombay

Core Paper I: Data Structures and C Programming

Instructional Hrs: 75   **Sub. Code: 15ITUC101/**

15CTUC101

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: To understand Problem Solving aspects and basic concepts in data

structures using 'C'.

UNIT I   **15 Hrs.**

Programming Development Methodologies – Programming Style – **Problem solving Techniques:** Algorithm, Flowchart, Pseudo code - Structure of a C program – C Character Set – Delimiters – Keywords – Identifiers – Constants – Variables – Rules for Defining Variables – Data Types – Declaring and Initializing Variables – Type Conversion. Operators and Expressions – *Formatted and Unformatted I/O Functions* – Decision Statements – Loop Control Statements.

UNIT II   **15 Hrs.**

Arrays – String and its Standard Functions. Pointers – Functions –   **Preprocessor Directives:** *#define directive, #include directive*.

UNIT III   **15 Hrs.**

Structure and Union: Features of Structure - Declaration and Initialization of Structure - Structure within Structure - Array of Structure - Pointer to Structure - Bit Fields - Enumerated Data Types - Union. **Files:** Streams and File Types - Steps for File Operation - File I/O - Structures Read and Write - Other File Functions - Command Line Arguments - *I/O Redirection.*

UNIT IV   **15 Hrs.**

Linear Data Structures: Introduction to Data Structures – **List:** Implementations –Traversal - Searching and Retrieving an Element - Predecessor and Successor – Insertion – Deletion - Sorting - Merging Lists – **Stack:** Representation - Terms - Operations on Stack - Implementation. Single Linked List - Linked List with and without Header - Insertion – Deletion. **Queues***: Various Positions of Queue* - Representation.

UNIT V   **15 Hrs.**

Searching and Sorting – **Searching:** Linear - Binary. **Sorting :** *Insertion - Selection* - Bubble - Quick - Tree - Heap.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

   Ashok N Kamthane - *Programming and Data Structures*,Pearson Education -

   First Indian Print - 2004.

REFERENCE BOOKS

1. **Aaron M Tanenbaum , Yedidyeh Langsam , Moshe J Ahugenstein** , *Data*

   Structure Using C, PHI Pub.2005

2. **Balagurusamy E** , *Programming in ANSI C,* Tata Mcgraw-Hill, 1998.

3. **Ellis Horowitz and Sartaj Sahni,** *Fundamentals of Data Structure* , Galgotia

   Book Source, 1999.

Practical I: Data Structures Using C Lab

Instructional Hrs: 75   **Sub. Code: 11ITUCP01/**

                                                                  11CTUCP01

Max. Marks: CIA -25; ESE -75   **Credits: 3**

Objective: To write C programs for solving simple problems and implement data
                structures.

1. Write a C program to generate 'n' Prime numbers.
2. Write a C program to create and manipulate array.
3. Write a C program to find the number of Palindromes in a given sentence.
4. Write a C program to display students detail using array of Structure.
5. Write a C program to write data to text file and read it.
6. Write a C program to calculate binomial co-efficient using NCR function
7. Write a C program to implement the operation of STACK.
8. Write a C program to implement QUEUE and perform the following:
      i.   Insertion
      ii. Deletion
      iii. Modification
      iv. Listing of elements using pointers
9. Write a C program to insert an element at the end of the LINKED LIST.
10. Write a C program to demonstrate Sequential Search.
11. Write a C program to demonstrate Binary search.
12. Write a C program to arrange a set of numbers in ascending order using QUICK-SORT.

Allied Paper I: Mathematics I - Computer Oriented Numerical Methods and Statistics

Instructional Hrs: 90   **Sub. Code: 11CAUA101/**

11ITUA101/

08CTUA101

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective: To gain knowledge to solve Algebraic & Transcendental Equations,

Numerical Differentiation, Interpolation, Measures of central tendency,

Correlation, Regression

UNIT I   **18 Hrs.**

The Solution of Numerical Algebraic and Transcendental Equations – Bisection Method – *Newton-Raphson Method* – The Method of False Position. The Solution of Simultaneous Linear Algebraic Equation – Gauss Elimination Method – Gauss Jordon Elimination Method – Gauss Seidal Method of Iteration – Gauss – Jacobi Method.

UNIT II   **18 Hrs.**

Numerical Differentiation – Newton's Forward Difference Formula – Newton's Backward Difference Formula – *Numerical Integration* – Trapezoidal Rule – Simpson's One-Third Rule – Simpson's Three – Eighths Rule.

UNIT III   **18Hrs.**

Interpolation – Newton Forward Interpolation Formula – *Newton Backward Interpolation Formula* – Lagrange's Formula – Numerical Solution of Ordinary Differential Equations – Taylor Method – Euler Method – Range Kutta Method.

UNIT IV   **18 Hrs.**

Measures of Central Tendency – Mean - Median and Mode – *Relation between Mean - Median and Mode.* Dispersion – Range – Mean Deviation and Standard Deviation.

UNIT V   **18 Hrs.**

Correlation : Karl Pearson's Coefficient of Correlation – *Rank Correlation* **Regression :** Regression Equations – Difference between Correlation and Regression.

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1**. Kandasamy P, Thilagavathi K, Gunavathi K**, *Numerical Methods,* S and Company   Ltd. New
   Delhi Revised Edition 2005   (UNIT I - II and III).

2. **Pillai R S N, Bagavathi V**, *Statistis,-* Sultan Chand and Sons and Company Ltd. New Delhi 2005.
   (UNIT IV and V).

REFERENCE BOOKS

1**. Balagurusamy E** , *Numerical Method,-* Tata MC Graw Hill-2007

2. **Gupta S.C, Kapoor V K,** *Fundamental of Mathematical Statistics* , Sultan Chand and Sons 2005.

3**. Rajaraman V** , *Computer Oriented Numerical Methods* , PHI Pub 2005.

Foundation Course- – Environmental Studies

Instructional Hrs: 30   **Sub. Code: 09FOCU1ES**

Max. Marks: CIA --nil; ESE -100   **Credits: 2**

Objective: To gain awareness about the environment, hazards and social issues.

UNIT I   **6Hrs.**

The multidisciplinary nature of environmental studies : Definition - Scope and importance - need for public awareness - natural resources and associated problems – forest resources - water resources - mineral resources - food resources - *energy resources* - land resources - role of an individual in conservation of natural resources - equitable use of resources for sustainable lifestyles.

UNIT II   **6Hrs.**

Concept of an ecosystem: structure and function of an ecosystem – producers - consumers and decomposers. **Energy flow in the ecosystem :** food chain - food webs and ecological pyramids - *ecological succession.*

UNIT III   **6Hrs.**

Biodiversity and its conservation : Introduction – definition - genetic - s*pices and ecosystem diversity.* **Conservation of biodiversity:** In-situ and Ex-situ conservation of biodiversity.

UNIT IV   **6Hrs.**

Definition - causes - effects and control measures of air pollution - water pollution - soil pollution - *noise pollution* & Thermal pollution. **Disaster management:**floods - earthquake -   cyclone and landslides.

B.Sc .,IT 2016-2017 onwards

UNIT V   **6Hrs.**

Global warming - ozone layer depletion - acid rain - nuclear accidents and holocaust (case studies). Consumerism and waste products - Environmental Protection Act- air - water - wildlife - *forest issues involved in enforcement of environmental legislation and public awareness.*

Note : Self study topics are denoted in *Italics*

Field work

Visit to a local area to document environmental assets – river / forest / grass land / hill/   mountain.

Visit to a local polluted site - urban / rural / industrial / agricultural.

Study of common plants - insects - birds.

Study of simple ecosystems – pond - river - hill slope - etc.

REFERENCE BOOK

 Environmental studies. Bharathiar University, Coimbatore, Published by Bharathiar University.

Core Paper II: Computer Organization and Architecture

Instructional Hrs: 60   **Sub. Code: 15ITUC202**

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: To learn number systems and boolean algebra, combinational and

sequential circuits and basic Architecture of a Computer.

UNIT I   **12 Hrs.**

Number System and Binary Codes: Decimal - Binary - Octal - Hexadecimal – Binary addition - Multiplication - Division – Floating Point Representation - Complements - BCD - Excess3 - Gray Code. **Arithmetic Circuits:** Half Adder - *Full Adder* - Parallel Binary Adder - BCD Adder - Half Subtractor - Full Subtractor - Parallel Binary Subtractor – **Digital Logic:** the Basic Gates – NOR - NAND - XOR Gates.

UNIT II   **12 Hrs.**

Combinational Logic Circuits: Boolean Algebra – Karnaugh Map – Canonical Form 1 – Construction and Properties – Implicants – Don't Care Combinations – Product of Sum - Sum of Products - Simplifications. **Sequential Circuits:** Flip-Flops: RS – JK – Multiplexers – Demultiplexers – Decoder – Encoder.

UNIT III   **12Hrs.**

Central Processing Unit: General Register Organization – Control Word – Examples of Micro Operations – Stack Organization – *Instruction Formats* – Addressing Modes – Data Transfer and Manipulation Program Control.

B.Sc .,IT 2016-2017 onwards

UNIT IV   **12 Hrs.**

Input–Output Organization: Input – Output Interface – I/O Bus and Interface – *I/O Bus Versus Memory Bus* – Isolated Versus Memory – Mapped I/O – Example of I/O Interface. **Asynchronous Data Transfer:** Strobe Control and Handshaking – Priority Interrupt: Daisy-Chaining Priority - Parallel Priority Interrupt. **Direct Memory Access:** DMA Controller - DMA Transfer. Input – Output Processor: CPU-IOP Communication.

UNIT V   **12 Hrs.**

Memory Organization: Memory Hierarchy – Main Memory – Associative Memory: Hardware Organization - Match Logic - Read Operation - Write Operation. Cache Memory: Associative - Direct - Set-Associative Mapping – Writing Into Cache Initialization..

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Morris Mano**, *Computer System Architecture***,** Pearson Publication , III Edition
   2006.
2. **Puri V K** *Digital Electronics Circuits and Systems,* ATA Mcgraw, HILL Pub.Company-2008.

REFERENCE BOOKS

1. **Albert Paul Malvino , Donald P Leach** , *Digital Principles and applications***,**
   TMH,Edition 1996.
2. **Carter** , *Computer Architecture* , Schaums outline series, TMH 2007.

Core Paper III: Object Oriented Programming with C++

Instructional Hrs: 60   **Sub. Code: 15ITUC203**

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: To understand Problem Solving aspects, OOPs concepts and develop skills for writing programs using C++.

UNIT I   **12 Hrs.**

Introduction to C++: Key Concepts of OOP – Advantages – Object Oriented Languages – **Input and Output in C++:** Streams in C++ – Pre-Defined Streams –Unformatted Console I/O Operations –Formatted Console I/O Operations – C++ Declarations – **Control Structures**: Decision Making Statements – If…Else – Jump – GOTO – Break – Continue – *Switch Case Statements* – Loops in C++ – For – While – Do…While Loops – Functions in C++ - In Line Functions – Function Overloading.

UNIT II   **12 Hrs.**

Class and Objects: Declaring Objects – Defining Member Functions – Static Member Variables and Functions – Array of Objects – Friend Functions – Overloading Member Functions – Bit Fields and Class. **Constructor and Destructors:** Characteristics – Calling Constructor and Destructors – *Constructor and Destructor with Static Member.*

UNIT III   **12 Hrs.**

Operator Overloading: Overloading Unary - Binary Operators – Overloading Friend Functions – Type Conversion – **Inheritance:** Types of Inheritance – Single - Multilevel - Multiple - Hierarchical - *Hybrid and Multi Path Inheritance* – Virtual Base Classes – Abstract Classes.

UNIT IV   **12 Hrs.**

Pointers: Declaration – Pointer to Class - Object – THIS Pointer – Pointer to Derived Classes and Base Classes – **Arrays:** Characteristics – Arrays of Classes – Memory Models – New and Delete Operators – Dynamic Objects – Binding - *Polymorphisms* and Virtual Functions.

B.Sc .,IT 2016-2017 onwards

UNIT V   **12 Hrs.**

Files: File Stream Classes – File Modes – Sequential Read/ Write Operations – Binary and ASCII Files – Random Access Operation- Command Line Arguments –**Exception Handling:** Principles of Exception Handling- The Keywords try, throw and catch-Exception Handling Mechanism-Multiple Catch Statements-Catching Multiple Exceptions-Rethrowing Exception –
Strings: Declaring and Initializing String Objects – String Attributes – *Miscellaneous Functions*.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

Ashok N Kamthane, *Object Oriented Programming with ANSI and Turbo C++*, Pearson Education Publ 2006.

REFERENCE BOOKS

1**. Balagurusamy E ,** *Object Oriented Programming With C++* - TMH Pub 1998.

2. **John R Hubbard ,** *Programming With C++* - TMH Publ. II Edition 2002.

3**. Maria Litvin and Gary Litvin** , *C++ For You* , Vikas Publ 2002.

Practical II: C++ Programming Lab

Instructional Hrs: 45   **Sub. Code: 15ITUCP02**

Max. Marks : CIA -25; ESE -75   **Credits: 1**

Objective: To design and implement 'C++' programs for simple problems.

1. Create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the stack to 0. Write a member function POP() to delete an element. Check for overflow and underflow conditions.

2. Create a class ARITH which consists of a FLOAT and an integer Variable. Write member ADD() - SUB() - MUL() - DIV() - MOD() to perform addition - subtraction - multiplication - division and modulus Respectively. Write member functions to get and display values.

3. Create a class MAT has a 2-d matrix and RandC represents the rows and columns of the matrix. Overload the operators + - - - * - to add - subtract and multiply two matrices. Write member functions to get and display MAT object values.

4. Create a class STRING. Write member function to initialize - get and display strings. Overload the operator + to concatenate two strings - = = to compare two strings and a member function to find the length of the string.

5. Create a class which consists of EMPLOYEE details like eno - ename - dept - basic-salary - and grade. Write member functions to get and display them. Derive a class PAY from the above class and write a member function to calculate da - hra - pf depending on the grade and Display the Payslip in a neat format using console I/O.

B.Sc .,IT 2016-2017 onwards

6. Create a class SHAPE which consist of two VIRTUAL FUNCTIONS Cal_Area() and Cal_PERI to calculate AREA and PERIMETER of various figures. Derive three classes SQUARE - RECTANGLE and TRIANGLE from the class SHAPE and calculate AREA and PERIMETER of each class separately and display the result.

7. Create two classes which consist of two private variables - one float and one integer variables in each class. Write member functions to get and display them. Write FRIEND function common to arguments and the integer and float values of both the objects separately and Display the result.

8. Write a user defined function USERFUN() which has the formatting commands like setw() - showpoint - showposprecision(). Write a program which prints a multiplication table and uses USERFUN() for formatting.

9. Write a program to perform Insertion - Deletion and Updation using files.

10. Write a program which takes a file as argument and copies in to another file with line numbers using Command Line Arguments.

Allied II: Mathematics II - Mathematical Foundations for Computer Science

Instructional Hrs: 75   **Sub. Code: 11ITUA202**

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective : To gain knowledge about Matrix, Relations, Graphs and Trees.

UNIT I   **15 Hrs.**

Matrices – Introduction – Determinant – Inverse of a Matrix – *Rank of a Matrix* – Eigen Value Problems**.**

UNIT II   **15 Hrs.**

Set Theory : Introduction – Set and its Elements – Set Description – Types of Sets – Venn – Euler Diagrams – Set Operations and Laws of Set Theory – *Fundamental Products* – Partitions of Sets – Minsets – Algebra of Sets and Duality – Inclusion and Exclusion Principle.

UNIT III   **15 Hrs.**

Mathematical Logic: Introduction – Prepositional Calculus – *Basic Logical Operations* – Tautologies – Contradiction – Argument – Method of Proof – Predicate Calculus.

UNIT IV   **15 Hrs.**

Relations: Binary Relations – Set Operation on Relations – Types of Relations – Partial Order Relation – Equivalence Relation – Composition of Relations – Functions – Types of Functions – *Invertible Functions* – Composition of Functions.

B.Sc .,IT 2016-2017 onwards

UNIT V   15 Hrs.

Graph Theory: Basic Terminology – Paths - Cycle and Connectivity – Sub Graphs – Types of Graphs – Representation of Graphs in Computer Memory – **Trees:** Properties of Trees – Binary Trees – Traversing Binary Trees – *Computer Representation of General Trees*.

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Sharma J.K** , *Discrete Mathematics* , Macmillan India Ltd, 2nd Edition, 2005.

2. **Dr.Venkataraman M.K,** *Engineering Mathematics Volume II* - NPC 4th Edition,

   2003 (Unit I).

REFERENCE BOOKS

1. **Tremblay R Manohar,** *Discrete Mathematics Structures With Applications to*

   Computer Science, Mc Graw Hill International Edition 2007.

2. **Dr.Venketaraman M.K, Dr.Sridharan N, Chandarasekaran N,** *Discrete*

   Mathematics, The National Publishing Company Chennai 2003.

Value Education: Value Education and Human Rights

Instructional Hrs : 30   **Sub Code: 14VEDU2HR**

Max Marks : CIA – Nil; ESE-100   **Credits : 2**

Objective: To gain knowledge about Human Values, Human Rights, Human Rights

Issues, Human Rights Enforcements, Indian Constitution

Unit I   **5 Hrs.**

Aim of Value Education –Concept of Human Values-Types of Values- Components of value   education - Personal Development : *Character formation towards positive personality*-National Values

Unit II   **5 Hrs.**

Concept and theories of Human Rights – *Classifications of Human Rights* – Universal Declaration of Human Rights- International   Covenant on civil and political rights – International   covenant on Economic, Social and Cultural Rights.

Unit III   **10 Hrs.**

Rights Guaranteed by Indian Constitution - Constitutional vision of freedom: Fundamental Rights – *Fundamental duties-* Constitutional vision of Justice: Directive Principles of State policy.

Unit IV   **5 Hrs.**

Human Rights Issues: Gender Discrimination-*Domestic violence*-Child Labour-Bonded Labour

B.Sc .,IT 2016-2017 onwards

Unit V   **5 Hrs.**

Human Rights Enforcements : National Human Rights Commission – State Human Rights Commission – Human Rights Courts – Role of NGO's : Amnesty International, Asia Watch – *Peoples Union for Liberties(PUCL),* Peoples Union for Democratic Rights (PUDR).

 Note: Self study topics are denoted in *Italics*

REFERENCE BOOKS

1. **Mugammad Naqi**, *Modern Value Education*, Anmol Publications Pvt Ltd,New Delhi,2007.
2. **Shrimali L.L**, *A Search for Values in Indian Education*, Vikas Publishers, Delhi, 1974.
3. **Acharya. N.K**, *The Constitution of India*, Asia Law House, Hyderabad, 2011.
4. **Misra R**., *Human Rights* Sumit Enterprises, New Delhi, First Edition,2005.
5. **Nirmal S.J**, *Human Rights in India*,Oxford University Press, New Delhi,2000.
6. **Durgadas Basu**, *Human Rights in Constitutional Law*, Prentice Hall of India,1994.
7. **Bajwa G.S**.,*Human Rights in India*, Anmol Publications, New Delhi,1995.

SEMESTER III

Core Paper IV: Java and Network Programming

Instructional Hrs: 75   **Sub. Code: 15ITUC304**

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: To have an understanding on the concept of Networks through Java.

UNIT I   15 Hrs.

An Overview of Java: A First Simple Program – Data Types – The Primitive Types – Type Conversion and Casting – Automatic Type Promotion in Expressions. Introducing Classes – A Closer Look at Methods and Classes. **Inheritance:** Inheritance Basics – Using Super – Creating a Multilevel Hierarchy – When Constructors Are Called – *Method Overriding* – Dynamic Method Dispatch – Using Abstract Classes – Using Final with Inheritance – The Object Class.

UNIT II   15 Hrs.

Packages and Interfaces: Packages – Access Protection – Importing Packages – Interfaces. Exception Handling: Exception Handling Fundamentals – Exception Types – Uncaught Exceptions – Using Try and Catch – Multiple Catch Clauses – Nested Try Statements – Throw – Throws – Finally – Java's Built-in Exceptions – *Creating Your Own Exception Subclasses*.

UNIT III   15 Hrs.

Multithreaded Programming: The Java Thread Model – The Main Thread – Creating a Thread – Creating Multiple Threads – Using isAlive() and Join() – Thread Priorities – Synchronization – Interthread Communication – Suspending, Resuming, an Stopping Threads – Using Multithreading. **Networking:** Networking Basics – The Networking Classes and Interface – *Inet Address* – Inet4 Address and Inet6 Address – TCP/ IP Client Sockets – URL – URL Connection – Http URL Connection – The URL Class – Cookies – TCP/ IP Server Socket – Datagrams.

UNIT IV   **15 Hrs.**

The Applet Class: Two Types of Applets – *Applet Basics* - Applet Architecture – An Applet Skeleton - Simple Applet Display Methods – Requesting Repainting – Using the Status Window – The HTML APPLET Tag. **Event Handling:** Two Event Handling Mechanisms – The Delegation Event Model – Event Classes – Sources of Events – Event Listener Interfaces – Using the Delegation Event Model – Adapter Classes – Inner Classes.

UNIT V   **15 Hrs.**

Introducing the AWT: AWT Classes – Windows Fundamentals – Working with Frame Windows – Creating a Frame Window in an Applet – Creating a Windowed Program – Displaying Information within a Window – Working with Graphics – Working with Color – *Setting the Paint Mode*. **Using AWT Controls, Layout Managers, and Menus:** Control Fundamentals – Labels – Using Buttons – Applying Check Boxes – Checkbox Group – Choice Controls – Using Lists – Managing Scroll Bars – Using a Text Field –Menu Bars and Menus.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

   Herbert Schildt, *Java: The Complete Reference*, Tata McGraw-Hill Publishing

   Company Limited, New Delhi. 7th Edition 2008.

REFERENCE BOOKS

1. **John R.Hubbard**, *Programming with Java*, TMH Publ, 1999**.**

2. **Xavier C** , *Programming with Java 2*, SciTech publ, 2000.

Core Paper V: Principles of Data Communication and Network

Instructional Hrs. : 75   **Sub. Code : 15ITUC305**

Max. Marks : CIA -25; ESE -75   **Credits: 4**

Objective : Enable the students to learn Network concepts, layers and Network

   Security.

UNIT I   **15 Hrs.**

Introduction: Data Communication – Networks – Protocols and Standards. **Basic Concepts:** Line Configuration – *Topology* – Transmission Mode – Categories of Networks – Internetworks. **The OSI Model:** The Model – Functions of the Layers – TCP/ IP Protocol Suite.

UNIT II   **15 Hrs.**

Signals: Analog and Digital. Transmission of Digital Data–**Interface and Modems:** Digital Data Transmission – DTE-DCE Interface – Other Interface Standards – Modems**. Transmission Media:** *Guided Media* – Unguided Media. **Multiplexing:** Many to One/One to Many – Frequency-Division Multiplexing (FDM) – Wave-Division Multiplexing (WDM) – Time-Division Multiplexing (TDM).

UNIT III   **15 Hrs.**

Error Detection and Correction: *Types of Errors* – Detection – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cyclic Redundancy Check (CRC) – Checksum – Error Correction. **Switching:** Circuit Switching – Packet Switching – Message Switching.

B.Sc .,IT 2016-2017 onwards

UNIT IV   **15 Hrs.**

Integrated Services Digital Networks (ISDN): Services – History. **Networking and Internetworking Devices:** Repeaters – Bridges – Routers – Gateways – *Other Devices* – Routing Algorithms – Distance Vector Routing – Link State Routing. **Network Security:** Four Aspects of Security – Privacy – Digital Signature – PGP – Access Authorization.

UNIT V   **15 Hrs.**

TCP/ IP Protocol Suite-Part 1: Overview of TCP/ IP – Network Layer – Addressing – Subnetting – Other Protocols in the Network Layer – Transport Layer. TCP/ IP Protocol Suite-Part 2, **Application Layer:** Client-Server Model – Bootstrap Protocol (BOOTP) and Dynamic Host Configuration Protocol (DHCP) – Domain Name System (DNS) – *Telnet* – File Transfer Protocol (FTP) – Trivial File Transfer Protocol (TFTP) – Simple Mail Transfer Protocol (SMTP) – Simple Network Management Protocol (SNMP) – Hypertext Transfer Protocol (HTTP) - World Wide Web (WWW).

Note : Self study topics are denoted in *Italics*

TEXT BOOK

   Behrouz A. Forouzan, *Data Communications and Networking*, Tata McGraw-Hill

   Publishing Company Limited – New Delhi, 2nd Edition 2008.

REFERENCE BOOKS

1. **Achyut s. Gogbole**, *Data Communications and Networks*, Tata McGraw-Hill,New

   Delhi, 1st Edition 2003.

2. **Madhulka Jain,Satish Jain**, *Data Communications and Networking***,**BPB

   Publication, 1st Edition 2002.

Core Paper VI: Software Engineering

Instructional Hrs. 75   **Sub. Code: 11CSUC511/ 08CAUC511/15ITUC306**

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: To learn engineering practices in Software development methodologies

and Evaluation methods.

UNIT I   **15 Hrs.**

Introduction – The evolving role of software - software crisis – software myths – software engineering layered technology- *software process*- software process models – prototyping model- Evolutionary software process models.

UNIT II   **15 Hrs.**

Analysis concepts & Principles: Requirements analysis and elicitation for software – Analysis principles - *software prototyping* – specification. **Analysis Modeling :** data modeling – functional modeling and information flow – behavioral modeling.

UNIT III   **15 Hrs.**

Design Concepts & Principles: The design process – design principles – design concepts – effective modular design. User Interface Design – The golden rules – UID – *Task analyzing and modeling* – Interface Design Activities – Implementation Tools – Design Evaluation.

UNIT IV   **15 Hrs.**

Component level design: Structured Programming – Comparison of Design notations Software testing techniques – Software testing fundamentals – Test case design - *White box testing* – Basis path testing – control structure testing – Black Box testing.

B.Sc .,IT 2016-2017 onwards

UNIT V   **15 Hrs.**

Software testing strategies – A strategic approach to software testing - Unit Testing – Integration testing   – *validation testing* – system testing - **Object oriented Design:** Design for Object Oriented Systems – System Design process – The object Design Process.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

   Roger S.Pressman, S*oftware Engineering,* TMH Publishers ,6th Edition 2005.

REFERENCE BOOKS

1. **Ian Somerville** , *Software Engineering,* Pearson Education Publ, 6th Edition, 2001.

2. **Watts S. Humphery**, *A discipline for Software Engineering*, Pearson Education Publishers, 2001.

Practical III: Java and Network Programming Lab

Instructional Hrs: 75   **Sub. Code: 09ITUCP03**

Max. Marks: CIA -25; ESE -75   **Credits: 3**

Objective: To enable the students understand the concepts of java and network

programming lab.

1. Write a Java program to create and import package.

2. Write a Java program to perform exception handling.

3. Write a Java program to illustrate thread priority.

4. Write a Java program to find the IP address.

5. Write a Java program to perform synchronous transmission with single client.

6. Write a Java program to perform synchronous transmission with multiple

   client.

7. Write a Java program to perform asynchronous transmission with single

   client.

8. Write a Java program to perform asynchronous transmission with multiple

   client.

9. Write a Java program to accept and display student information using

   AWT.

10. Write a Java program to create a frame with response to the mouse click

    for each event with mouse (Such as Mouse up, Mouse Down etc) the

    corresponding message must be displayed.

11. Write a Java program to draw circle, ellipse, square, rectangle at the

    mouse click position.

12. Write a Java program to create menu bar and pull-down menu.

Allied Paper III: Microprocessor and its Architecture

Instructional Hrs: 75   **Sub. Code: 11ITUA303/**

15CTUA303

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective: To understand the architecture of Intel 8086, Intel 386 and Intel 486

microprocessor.

UNIT I   **15 Hrs.**

Introduction to microprocessors: Evolution of microprocessors – Single -chip Microcomputer - Embedded Microprocessors – Bit - Slice processors -Microprogramming - RISC and CISC Processors - *Scalar and Superscalar Processors* - Vector Processors - Array Processors - Symbolic Processors – Digital Signal Processors. Intel 8086 - Pin Description of Intel 8086 - Operating modes of 8086 - Register organization of 8086 - BIU and EU - Interrupts - 8086 based computer system - Addressing Modes of 8086.

UNIT II   **15 Hrs.**

8086 Instruction Set - Instruction Groups - Addressing Mode Byte -Segment Register Selection - Segment Override - 8086 Instructions. **Assembly Language Programs for 8086:** Largest Number, Smallest Number in a Data Array - *Numbers in Ascending and Descending order* -Block Move or Relocation -Block Move using REP instruction - Sum of a series -Multibyte Addition.

UNIT III   **15 Hrs.**

Intel 386 and 486 Microprocessors: Intel 386 and 486 Microprocessor -486DX Architecture - Register Organization of 486 Microprocessor - Memory Organization - Operating Modes of Intel 486 - *Virtual Memory* - Memory Management Unit- Gates -Interrupts and Exceptions -Addressing Modes of 80486 - Pin Configuration.

B.Sc .,IT 2016-2017 onwards

UNIT IV   **15 Hrs.**

Input devices - Output devices - Memory and I/O addressing - 8086 Addressing and Address Decoding - Programmable I/O Ports - DMA Data Transfer. Other Microprocessors - PowerPC Microprocessors - Pentium Microprocessors - *Pentium Pro-microprocessor* - Alpha Microprocessor - Cyrix Microprocessor - MIPS Microprocessor – AMD Microprocessor.

UNIT V   **15 Hrs.**

MOTOROLA 68000, MOTOROLA 68020, MOTOROLA 68030, MOTOROLA 68040**. Interfacing of A/D Converter and Applications:** Introduction -Interfacing of ADC 0808 or ADC 0809 to Intel 8086 - Bipolar to Unipolar Converter - Sample and Hold Circuit, LF 398 – Microprocessor based Measurement and Control of Physical Quantities.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

Badri Ram, *Advanced Microprocessors and Interfacing***,** Tata McGraw-Hill

Publishing Company Limited, 2014.

REFERENCE BOOK

A.K. Ray, K.M. Bhurchandi, *Advanced Microprocessors and Peripherals***,** Tata

McGraw Hill Publishing Company Limited, Second Edition, 2007.

Skill Based Subject-I: Database Management through Access - Lab

Instructional Hrs: 45   **Sub. Code: 11ITUSP01**

Max. Marks: CIA -40; ESE -60   **Credits: 3**

Objective: To create and manipulate database through Access.

1. Create an employee table with the following fields.
    a) Number, Name, Dept, Designation, Address1, Address2, City.
    b) Set the number as primary key
2. Modify the employee table structure
    a) Delete the address field.
    b) Add experience salary field
    c) Insert the primary key.
3. Update the designation and salary for those who have completed 10 years of service in the employee table.
4. Sort the employee table by name and date of joining.
5. Filter the table content using
    - Filter by form
    - Filter by selection
6. Display the employee details by department wise and date of joining wise.
7. Create a query to display date of joining, designation of those who have completed 15 years service.
8. Design a form to display employee number, name, department, service and salary.
9. Create a report to display employee number, name, salary and designation.
10. Import data from Excel sheet.

B.Sc .,IT 2016-2017 onwards

Non Major Elective– I: Data Processing Through Excel - Lab

Instructional Hrs. 30   **Sub. Code : 11ITUNP01**

Max. Marks: CIA -Nil; ESE -100   **Credits: 2**

Objective: To Create, Edit and format Worksheet, analyze data using advanced

features in Excel.

1. Create a worksheet and perform the following formats for a list containing

   text, data and number.

   i.   Aligning entries –Indent, Rotate etc.
   ii.   Formatting Borders, Date and Numbers.
   iii.   Conditional Formatting.
   iv.   Creating a custom style.

2. Create a sheet containing Nation-wide sales results for Avon Helmets-Region

   Vendor name- Helmet type, Helmet Color and total sales.

   i.   Sort the data by Region, Vendor name and sales.
   ii.   According to a custom list of Helmet Color-Red, Blue, Yellow and Green.

3. Create a sheet containing Nation-wide sales results for Avon Helmets-Region

   Vendor name- Helmet type, Helmet Color and total sales.

   i.   Use Filtering on Region and Helmet type.
   ii.   Use sub total function to count the no. of records and sum of sales for
          the filtered records.

4. Use query wizard to filter East, West Region transaction and sort them on

   Region and total sales.

B.Sc .,IT 2016-2017 onwards

5. Perform the following.

      i.   Create a list of vendor and total sales by consolidating the total sales.

     ii.   Compute sub totals with no detail data.

    iii.   Create Subtotals by both Region and vendor within Region.

6. Create a PIVOT TABLE to show the sales results by Region and Helmet type

   and summarize the total sales.

7. Create a PIVOT chart for the pivot table of total sales for the Region and

   Helmet types.

8. Create a pie chart to show the sales results for different Helmet type and to

   the following formats.

      i.   Add a Secondary axis.

     ii.   Create picture markers.

Core Paper VII: Operating System

Instructional Hrs: 75   Sub. Code: 11ITUC407/

                                                                        11CTUC306

Max. Marks: CIA -25; ESE -75   Credits: 4

Objective: To learn the basic concepts and functions of operating system.

UNIT – I   **15 Hrs.**

Introduction: What is an Operating System? – **Process Concepts** – **Asynchronous Concurrent Processes**

UNIT – II   **15 Hrs.**

Deadlock and Indefinite Postponement - **Storage Management Real Storage:** Introduction- Storage Organization- Storage Management- Storage Hierarchy- Storage Management Strategies-Contiguous Vs Noncontiguous Storage Allocation-Single User   Contiguous Storage Allocation-Fixed Partition Multiprogramming-Variable Partition Multiprogramming- Multiprogramming with Storage Swapping.

UNIT – III   **15 Hrs.**

Virtual Storage Organization: Introduction – Evolution of Storage Organizations – Virtual Storage – Multilevel Storage Organization – *Block Mapping* – Paging – Segmentation – Paging / Segmentation Systems.

UNIT – IV   **15 Hrs.**

Virtual Storage Management: Introduction - Virtual Storage Management Strategies – Page Replacement Strategies – Locality – *Working Sets* – Page Fault Frequency Page Replacement – Demand Paging. **Job and Processor Scheduling:** Introduction – Scheduling levels – Objectives – Criteria – Preemptive Vs

Non-preemptive Scheduling – Interval Timer – Priorities – Deadline Scheduling – FIFO – RR – Quantum Size – SJF – SRT – HRN – Multilevel Feedback Queues.

UNIT – V   **15 Hrs.**

Disk Performance Optimization: Introduction – Operation of Moving-Head Disk Storage – Need for Disk Scheduling – Seek Optimization – Rotational Optimization – System Consideration – Disk Caching – *Other Performance* – Enhancement Techniques – RAM and Optical Disks. **File and Database Systems :** Introduction – The File System – File System Functions – The Data Hierarchy – Blocking and Buffering – File Organization – Queued and Basic Access Methods – Allocating and Freeing Space – File Descriptor – Access Control Matrix – Access Control by User Classes – Backup and Recovery.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

  Deitel H.M, *Operating Systems,* Pearson Education Publication, , 2nd Edition, 2005.

REFERENCE BOOK

  Achyut S Godbole, *Operating System*, TMH Publications, 2003.

Core Paper VIII: PC Hardware and Troubleshooting

Instructional Hrs: 75   Sub. Code: 15ITUC408/15CTUC510

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: Enable the students to learn the hardware concepts and troubleshooting of

a computer.

UNIT I   **15 Hrs.**

PC-Hardware Overview: Introduction-Hardware-BIOS-DOS Interaction-The PC family-PC Hardware-Interconnections Between Boxes-Inside the System Box-Motherboard Logic-*DMA Channel*-Floppy Disk Controller (FDC)- Memory Refresh-Post Sequence-*Overview of advanced PCs.*.

UNIT II   **15 Hrs.**

Support Chips in the Motherboard : Introduction-Dumb and Smart Chips- Clock generator-Bus Controller-Interrupt Controller-Programmable Interval Timer-8255A-5 Programmable Peripheral Interface(PPI)-DMA Controller-*Support chips for advanced microprocessors*. **Print Controller:** Controller Hardware overview. **Hard disk Controller Subsystem:** Overview of HDC Organization.

UNIT III   **15 Hrs.**

PC Bus and Motherboard: PC Bus and Motherboard Functions-Reset Logic (8088-PC)-DMA Logic (8088-PC)-wait State Logic (8088-PC)-Time of Day (TOD) Logic (8088-PC)-Speaker Logic (8088-PC)-Keyboard Interface (8088-PC)-SMPS

Display Adapter: Introduction-CRT Display-CRT Controller Principle-CRT Controller- Color/Graphics Adapter-*Second Generation Graphics Adapters*-New Trends in Display Controllers-Display Adapters Interface.

UNIT IV   **15 Hrs.**

Installation and Preventive Maintenance-System Configuration-Pre-Installation Planning-*Installation Practice*-Routine Checks-PC Assembling and Integration -Engineering Version and Compatibility-Preventive Maintenance-Virus-Data recovery

B.Sc .,IT 2016-2017 onwards

UNIT V   **15 Hrs.**

Keyboard Maintenance and Troubleshooting–correcting problem keyboards-vacuum cleaners and keyboards-replacing the spacebar-preventing problems-dealing with large objects-dealing with spills-disabling a keyboard-**Troubleshooting a Pointing Device -**mouse/trackball interfaces-serial mice-bus mice-PS/2 mice-USB mice-mouse driver software issues-mouse keys under windows 9x-adjusting mouse properties-common detection issues- **Modem Troubleshooting-**check the command processor-check the dialer and telephone line-typical communication problems-modem troubleshooting in windows 98-resolving resource conflicts-other issues-checking modem firmware-**Troubleshooting a Soundboard**-dos drivers and driver order- full duplex drivers-soundboard acceleration-multiple codecs-WAV playback problems-**Troubleshooting Video Adapters-**Basic problem isolation-multiple display support guide-missing display options.

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Govindarajalu B**, *IBM PC and Clones Hardware, Troubleshooting and*

   Maintenance, Tata McGraw-Hill Publishing Company Limited, New Delhi-Second

   Edition 2008. (Unit 1- 4)

2. **Bigelow's**, *Troubleshooting,Maintaining &Rerparing PCs* , Tata McGraw-Hill

   Edition 2001,Fifth Edition (Unit 5)

REFERENCE BOOKS

1. **Craig Zacker and John Rourke**, *The Complete Referenec-PC Hardware*, Tata McGraw-Hill Publishing Company Limited, New Delhi Edition-2001.
2. **Ron Glister**, *PC Hardware a Beginner's Guide*, Tata McGraw-Hill Publishing Company Limited, New Delhi Edition-2001.
3. **Sanjay K Bose**, *Hardware and Software of Personal Computers*, New Age International (P) Limited, Publishers, New Delhi 2000.

Core Paper IX: Client / Server Computing

Instructional Hrs: 75   **Sub. Code: 15CAUC409/ 15ITUC409 /**

15CTUC613

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: To learn the basic concepts of Client / Server computing, operating

systems and SQL Database servers.

UNIT I   **15 Hrs.**

Client – Server computing - What is client / server? – File servers, database servers, Transaction servers, Groupware servers, Object servers, Web server – *FAT server* or client / server -Client / Server building blocks

UNIT II   **15 Hrs.**

Client / Server and operating systems – the Anatomy of a server program – Needs of Client / Server from an OS – server scalability – Client anatomy – *Client and server OS trends* – Client OS and server OS. NOS: Creating the single system image - Remote procedure Calls (RPC) – Messaging and Queuing: The MOM Middleware

UNIT III   **15 Hrs.**

SQL Database servers: What does SQL do? – The ISO standards – What does a database server do? – Stored procedures, Triggers and Rules. Data warehouses – OLTP (Online Transaction Processing) – *Decision Support System (DSS)* – Executive Information System (EIS) – comparing Decision Support and OLTP system – Production vs. Information Database – The data ware house

UNIT IV   **15 Hrs.**

Client / Server Transaction Processing – The ACID properties – Transaction Models – TP monitors – Client / Server groupware – *Importance of Groupware* – What is Groupware – The components of Groupware. Distributed Object, CORBA style – CORBA : ORB- The Anatomy of a CORBA ORB.

UNIT V   **15 Hrs.**

Web client / server – The Evolution of the Web- Client/Server , Web Style-What is URL? –Shortest HTML tutorial – HTTP – 3tier client / server – HTML web based forms – CGI: The server side of the web .

Note : Self study topics are denoted in *Italics*

TEXT BOOK

    Robert Orfali, Dan Harkey and Jeri Edwards, *Client /Server Survival guide,*

    Wiley India Edition, 3ʳᵈ Edition, 2008.

REFERENCE BOOKS

1. **Nein Jenkins**, *Client / Server Unleashed*, 1ˢᵗ Indian Edition, 1998,Tech Media .

2. **Partick N.Smith, Steven L.Guengerich**, *Client /Server Computing* , 2ⁿᵈ Edition,

    2002, PHI.

Practical IV: PC Hardware and Troubleshooting Lab

Instructional Hrs: 75   **Sub. Code: 08ITUCP04/**

                                                                                        08CTUCP05

Max. Marks: CIA -25; ESE -75   **Credits: 3**

Objective: To develop the skill of troubleshooting and assemble the computer

hardware.

1. Create a Partition in a given Hard Disk.
2. How to install the new modem and connect the internet.
3. Configure the given printers and take the print out successfully.
4. What are the types of SMPS and measure the given SMPS output voltage.
5. Install the given virus scanner software and detect any virus found in your machine.

6. Install the Microsoft office XP for given PC.
7. How to configure the given web camera and activate them.
8. What are the steps involved in Sound Card Driver Installation.
9. Install the Network Interface Card and assign the IP Address for the NIC and Check the connectivity between two machines.

10. Trouble shoots the problem – System hangs during booting.
11. Troubles shoot the problem – Keyboard not working.
12. Trouble shoot the Problem – Wrong character print put.

B.Sc .,IT 2016-2017 onwards

Allied Paper IV: Software Project Management

Instructional Hrs: 75   **Sub. Code: 15ITUA404**

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective: To enable the students understand the concepts of developing Project.

UNIT I   **15 Hrs.**

Introduction-Software projects versus other types of project-Problems with projects -Stakeholders–An overview of project planning –*Project evaluation*- Technical plan content list – Software effort estimation.

UNIT II   **15 Hrs.**

Activity planning - project schedules- projects and activities-*sequencing and scheduling activities-*network planning model- shortening the project duration-identifying critical activities.

UNIT III   **15 Hrs.**

Risk management-resource allocation-Monitoring and control-Managing people and organizing teams-*planning for small projects.*

UNIT IV   **15 Hrs.**

Software configuration management**-**Introduction -The Processes and Activities of Software Configuration Management-Configuration Status Accounting-Configuration Audit-Software Configuration Management in Geographically Distributed Teams-Metrics in Software Configuration Management- Software Configuration Management Tools and Automation.

B.Sc .,IT 2016-2017 onwards

UNIT V   **15 Hrs.**

Case study – Prince Project management.

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Gopal Samy Ramesh**, *Managing Global software projects*, TMH publ, 2002.

2. **Mike Cotrell, Bob Huges**, *Software Project Management*, Inclination/Thomas

   computer press, 1995.

REFERENCE BOOKS

1. **Bob Hughes S.A, Mike Cotterel**, *Software Project Management*, TMH, New Delhi, 4th Edition, 2006.
2. **Derrel Ince, Sharp H and Woodman M**, *Introduction to Software Project Management and Quality Assurance*, Tata McGraw Hill, 1995.
3. **Kelkar** , *Software Project Management –A concise study*, PHI, New Delhi, 2003
4. **Stephen H. Kan**, *Metrices and Models in Software Quality Engineering*, Pearson Education Asia, New Delhi, 2nd Edition.

Skill Based Subject-II: Multi Skill Development Paper

Instructional Hrs   : 45   Sub Code: 13CSUS402/13CAUS402/13ITUS402/13CTUS402

Max.Marks:100 (ESE – 60 CIA – 40)   **Credits: 3**

Objective: To acquire soft skill, logical and numerical aptitude to get success in

Competitive examinations and Interviews.

UNIT I   **9 Hrs.**

Communication: Question tag – Gerund and Infinitives – Spotting the errors – Vocabulary – Synonyms – Antonyms - Prepositions – Articles – One word substitution – Sentence completion.

UNIT II   **9 Hrs.**

Numerical Aptitude : Problems on numbers - Problems on Ages – Percentage - Profit and loss - Ratio & Proportion - Time & Work - Time & Distance - *Simple Interest* - Compound Interest.

 UNIT III   **9 Hrs.**

Critical Reasoning: Logical Inference Questions and Syllogism.

Analytical Reasoning: Arrangement problems – Family / Blood Relation Qualms – Sense of Directions – Age Doubts.

Verbal Reasoning: Verbal Analogy (Letter series and number series only) – Coding and Decoding.

UNIT IV   **9 Hrs.**

Self Introduction - **Presentation Skills** - Presentation through PowerPoint – **Soft Skills -** Interpersonal Skills – Employability Skills – Soft Skills Training – *Resume Preparation* – Interview Tips and Questions.

UNIT V   **9 Hrs.**

Group Discussion – Importance – Types of GD – GD Skills – GD Etiquette(do's and don'ts) – Essential Elements of a GD – *Movements and Gestures to be avoided in a GD* -**Online Services** –Reservation – Banking –Purchases –Passport application.

REFERENCE BOOKS

1. **Hari Mohan Prasad & Uma Rani Sinha. 2011.** Objective English for Competitive Examinations. New Delhi: Tata McGraw Hill Education Private Ltd. (Unit – I)

2. **R.S. Aggarwal**, *Quantitative Aptitude*, S.Chand 2010. (Unit - II)

3. **Edgar Thorpe**, *Test of Reasoning for Competitive Examinations –4ᵗʰ edition*, Tata McGraw-Hill Publishing Company Limited, New Delhi. (Unit – III)

4. **R.S. Agarwal**, A Modern Approach to Verbal Reasoning (Fully Solved) –Revised Edition, S.Chand Company Limited, New Delhi, 2012. (Unit – III)

5. **M. S. Rao,** *Soft Skills Enhanching Employability-Connecting Campus with Corporate,* IK International Publishing House, NewDelhi, 2010. (Unit – IV)

6. **Alex.K**, *Soft Skills-Know Yourself and Know the World,* S.Chand Company Ltd., 2011.(Unit V)

7. *Group Discussions- Pass with Flying Colours,* G. K. Publications, NOIDA, 2012.

8. **Jain T.S.Upkar's**, *SBI Clerical Cadre Recruitment Examination*. Agar Upkar Prakashan

Non-Major Elective II: Web Designing (Dreamweaver) – Lab

Instructional Hrs: 30   **Sub. Code: 11ITUNP02**

Max. Marks: CIA – Nil; ESE – 100   **Credits: 2**

Objective: To design simple web pages using Dream Weaver.

1. Design a new web site consisting of some html files for a product of your

   choice. Name the home page file as index.htm.

2. Create an order list, un-order list, definition list and some nested list. Change the text alignment, text style, text color in the page.

3. Create your favorite link page that includes links to all your favorite web sites. Use either descriptive words or the URL of the link as the text that displays as hyper link.

4. Insert an image into a web page and use any five Dreamweaver's image editing tools. Use sharpen, cropping & brightness/contrast. Then perform image resizing and image re-sampling.

5. Insert a sound and movie file into a web page and create hyperlinks to the same.

6. Create a table with text in column 1 and numbers in column 2. Perform ascending and descending sorts on both the columns.

7. Insert a table and perform merging and splitting of cells. Insert a nested table into one of the cells in standard mode or in layout mode.

8. Create a form to collect the user data of your choice. Format the form objects and labels with a table, so that they line up nicely. Place the submit and reset buttons in the bottom row of the table and merge the cells.

Core Paper X: GUI Design Tools

Instructional Hrs: 90   **Sub. Code: 08ITUC510/ 11CTUC408**

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: To gain awareness of graphical user interface concepts through Visual Basic.

UNIT I   **18 Hrs.**

Introduction to Visual Basic – Visual Basic Programming Environment – Variables, data types & modules – Working with forms – Procedures, functions and control structure – Arrays – operators – *Built-in functions*.

UNIT II   **18 Hrs.**

Creating and using Standard controls – Text box – *Command Button* – Check Box – Combo Box – List Box – Label – Option button – Timer control – Frames – Scroll Bars – Working with control arrays – Graphics for applications.

UNIT III   **18 Hrs.**

Menus - Mouse events – *Dialog Boxes* – Rich Text Box – Single Document Interface – Multiple Document Interface – Flex grid control.

UNIT IV   **18 Hrs.**

Data Access Objects(DAO) – Creating a Database – creating a record set – Type of Record sets – Opening a database – Add, Edit, Update& Delete a records – moving to the first, last, next & previous records – *searching* & sorting a record set.

UNIT V   **18 Hrs.**

Active X Data Objects (ADO) – Data Environment Designer – Data Report - Creating a simple data report – Data Bound control – MS Hierarchical Flex-grid.

Note : Self study topics are denoted in *Italics*

B.Sc .,IT 2016-2017 onwards

TEXT BOOK

Visual Basic 6 Programming by Content Development Group, TMH Publishers

2010.

REFERENCE BOOKS

1. **Gray Cornel,** *Visual Basic 6 from the Ground up* 2007.

2. **Scott Warner**,*Teach Yourself Visual Basic 6*, Tata Mc Graw Hill Edition, 2000.

Core Paper XI: Relational Database Management Systems

Instructional Hrs: 75   **Sub. Code: 16CSUC407/ 16CAUC407/16ITUC511/16CTUC304**

Max. Marks: CIA – 25; ESE – 75   **Credits: 3**

Objective: To learn the basic principles of database and design, basics of RDBMS,

Object Based Databases and database manipulation using SQL

UNIT I   **15 Hrs.**

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De-normalization.

UNIT II   **15 Hrs.**

Oracle9i: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - iSQL *Plus.

Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

*Implementing the SQL*Plus Commands using Create, Update, Alter, Drop, Rename, Truncate and Spooling*

UNIT III   **15 Hrs.**

Working with Table: Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure.

B.Sc .,IT 2016-2017 onwards

Writing queries to Add, Update, Delete records, Retrieving data from a table using Where and ORDERBY Clause.

UNIT IV   15 Hrs.

Functions and Grouping: Built-in functions –Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations. *Designing queries using Built in functions.*

PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators.

UNIT V   15 Hrs.

Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation – Transaction Control statements.

Implementing the basic control structures in PL/SQL – sequential structure, selection structure and looping structure.

PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions. **PL/SQL Named Blocks :** Procedures – *Functions* – Packages –Triggers.

Declaring Cursor, Exception, Functions and Triggers.

Note: Lab activities are denoted in *Bold Italics.*

TEXTBOOK

Nilesh Shah, *Database Systems Using Oracle,* 2nd edition, PHI, 2008.

(UNIT I: Chapters 1 & 2 UNIT II: Chapters 3 & 4 UNIT III: Chapters 5 & 6 UNIT IV: Chapters 10 & 11 UNIT V: Chapters 12, 13 & 14)

REFERENCE BOOKS

1. **Arun Majumdar, Pritimoy Bhattacharya**, *Database Management Systems,* TMH, 2007.

2. **Gerald V. Post**, *Database Management Systems,* TMH, 3rd edition. 2008.

Core Paper XII: Software Testing

Instructional Hrs: 75   **Sub. Code: 15CSUC613/ 15CAUE622/ 15ITUC512**

Max. Marks : CIA -25; ESE -75   **Credits: 4**

Objective: To learn various software testing strategies and metrics.

UNIT I   **14 Hrs.**

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models.

UNIT II   **15 Hrs.**

White-Box Testing: Static Testing – *Structural Testing* –Challenges in White-Box Testing. **Black-Box Testing:** What is Black-Box Testing? - Why Black-Box Testing? –When to do Black-Box Testing? – How to do Black-Box Testing? – *Challenges in White Box Testing*.

UNIT III   **15 Hrs.**

 Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash. **System Testing:** System Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing.

 UNIT IV   **16 Hrs.**

Acceptance Testing: Acceptance Testing – Summary of Testing Phases. **Performance Testing:** Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges.

UNIT V   **15 Hrs.**

 Test Planning, Management, Execution and Reporting: Test Planning – Test Management – *Test Process* – Test Reporting – *Best Practices*.

Note : Self study topics are denoted in *Italics*

B.Sc .,IT 2016-2017 onwards

TEXT BOOK

Srinivasan Desikan & Gopalswamy Ramesh, *Software Testing Principles and*

Practices, 2006, Pearson Education, 7th Edition, 2009.

(UNIT-I: 2.1-2.5 UNIT-II: 3.1-3.4, 4.1-4.4 UNIT III: 5.1-5.5, 6 .1-6.5

(UNIT IV: 6.6-6.7, 7.1-7.6 UNIT-V: 15.1-15.6)

REFERENCE BOOKS

1. **Renu Rajani, Pradeep Oak**, *Software Testing*, TMH, 5th Edition, 2007.

2. **William E.Perry**, *Effective Methods of Software Testing* , Wiley India, 3rd

    Edition, 2008.

Practical V: GUI DESIG LAB

Instructional Hrs: 75   **Sub. Code: 16CTUCP04**

Max. Marks: CIA – 40; ESE – 60   **Credits: 3**

Objective: To gain programming skill in GUI.

1. Develop a VB Project to Check User Name & Password Given by User.

2. Develop a VB Project to Add & Remove Items From List Box.

3. Develop a VB Project to Copy all Items in a List Box to Combo Box.

4. Develop a VB Project to Enter and Display Student Information.

5. Develop a VB Project to Scroll Text from Left to Right Using Timer.

6. Develop a VB Project to Mini Calculator Functions.

7. Develop a VB Project to Documents typing using MDI Form.

   Use Employee Information For the Following Projects.

8. Develop a VB Project to Search a Record in MS-ACCESS database using data control.

9. Develop a VB Project to Delete a Record from MS-ACCESS database using data control.

10. Develop a VB Project to Perform following Operations in MS-ACCESS database using DAO. A). Move First Record. B).Move Next Record C).Move Previous Record. D).Move Last Record.

11. Develop a VB Project to Insert a Record in MS-ACCESS database using ADO.

12. Develop a VB Project to modify a record in MS-ACCESS database using ADO

B.Sc .,IT 2016-2017 onwards

Elective - I: E1.1 Enterprise Resource Planning

Instructional Hrs: 90   **Sub. Code: 15CAUA404/ 15ITUE511**

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective: To learn fundamental concepts, manufacturing perspective, modules and

benefits of ERP.

UNIT I   **18 Hrs.**

Introduction to ERP: Introduction-Evolution of ERP-What is ERP?-Reasons for the growth of the ERP market-The advantages of ERP-why do many ERP implementations fails?-Why are ERP packages being used now?.

UNIT II   **18 Hrs.**

ERP-A manufacturing perspective : Introduction-ERP-CAD/CAM-Materials Requirement Planning(MRP)-Bill Of Material-Closed loop MRP-Manufacturing Resource Planning(MRP-II)-Distribution Requirements Planning(DRP)-JIT and Kanban-Computer Aided Design/ComputerAided Manufacturing(CAD/CAM)-ProductDataManagement(PDM)-Data Management-Benefits of PDM-Make-To-Order(MTO) and Make-To-Stock(MTS)-Assemble-To-Order(ATO)-Engineer-To-Order(ETO)-Configure-to-Order(CTO).

UNIT III   **18 Hrs.**

ERP Modules: Introduction–Finance-Plant Maintenance-Quality Management-Materials Management.

UNIT IV   **18 Hrs.**

Benefits of ERP: Introduction-Reduction of Lead-Time-On-Time Shipment-Reduction in cycle Time-Improved Resource Utilisation-Better Customer satisfaction-Improved Supplier Performance-Increased Flexibility-Reduced Quality costs-Improved Information Accuracy and Decision Making Capability.

UNIT V   **18 Hrs.**

ERP Implementation Lifecycle: Introduction-Pre-Evaluation-Screening-Package Evaluation-Project Planning Phase-Gap analysis-Reengineering-Configuration-Implementatio`n Team Training-Testing-Going Live-End-User Training-Post Implementation(Maintenance mode).

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

    Alaxis leon, *" Enterprise Resource Planning"*,Tata Mcgraw Hill , Newdelhi 2006.

REFERENCE BOOKS

1. **Mary Summer**," *Enterprise Resource Planning*", Pearson Education 2006.
2. **RaviShankar**, **S.Jaiswal**, "*Enterprise Resource Planning*", Galgolia Publication Pvt. Ltd., New Delhi 1999.

Elective – I: E1.2. Network Security and Administration

Instructional Hrs: 90   **Sub. Code: 11ITUE521**

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective: To enable the students understand the concepts of Cryptography and

algorithms.

UNIT I   **18 Hrs.**

Attacks on Computer and Computer Security: Introduction – The Need for Security – *Security Approaches* – Principles of Security – Types of attacks.

UNIT II   **18 Hrs.**

Cryptography Concepts and Techniques: Introduction – *Plain text and Ciper text* – Encryption and Decryption – Symmetric and Asymmetric key Cryptography. **Symmetric key Algorithms:** Introduction – Algorithm types and Modes.

UNIT III   **18 Hrs.**

Symmetric key Algorithm: An overview of Symmetric key Cryptography – Data Encryption Standard [DES] – *International Data Encryption Algorithm [IDEA]* – RC4 – Blowfish.

UNIT IV   **18 Hrs.**

Asymmetric key Algorithms: Introduction – Brief History of Asymmetric key Cryptography – An overview of Asymmetric key Cryptography – The RSA Algorithm - Symmetric Asymmetric key Cryptography together- *Digital Signatures*.

UNIT V   **18 Hrs.**

Digital Certificate and Public key Infrastructure (PKI): Introduction –*Digital Certificate* – Private key Management – The PKIX Model – Public key Cryptography Standards (PKCS) – XML, PKI and Security.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

    Atul Kahate, *Cryptograpy and Network Security*, Tata Mcgraw – Hill Publishing,

    Second Edition, 2003.

REFERENCE BOOKS

1. **Behrouz A.Forouzan**, *Cryptograpy and Network Security*, Tata Mcgraw – Hill

    Publishing, 1st Edition, 2007.

2. **William Stallings**, *Cryptograpy and Network Security: Principles and Practice***,**

    Pearson education, 3rd Edition, 2004.

Elective I: E1.3. Big Data Analytics

Instructional Hrs: 90   **Sub. Code: 15CSUE531/**

                                                    15CAUE521/

                                                    15ITUE531/

                                                    15CTUE521

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective: To understand the challenges in architectures to manage and perform

        analytics on big data for data intensive applications.

UNIT - I   **14 Hrs**

Introduction: Data mining and predictive analytics - The behavior and benefits of predictive models - Applications of predictive analytics - Reaping the benefits, avoiding the pitfalls - What is Big Data? - *How much value does Big Data add?*- **Using Predictive Models :** objectives - Decision making - challenge – Discussion - Override rules (business rules)

UNIT - II   **18 Hrs**

Analytics, Organization and Culture: Embedded analytics - Learning from failure - A lack of motivation - A slight misunderstanding - Predictive, but not precise - Great expectations - *Understanding cultural resistance to predictive analytics*. **The Value of Data :** What type of data is predictive of behavior? - Added value is what's important - Where does the data to build predictive models come from? - The right data at the right time - How much data do I need to build a predictive model?

UNIT - III   **20 Hrs**

Ethics and Legislation: A brief introduction to ethics - Ethics in practice - The relevance of ethics in a Big Data world - Privacy and data ownership - Data security – Anonymity - Decision making. **Types of Predictive Models :** Linear models - Decision trees (classification and regression trees) - (Artificial) neural networks - Support vector machines (SVMs) – Clustering - Expert systems (knowledge-based

systems) - What type of model is best? - Ensemble (fusion or combination) systems - *How much benefit can I expect to get from using an ensemble?* - The prospects for better types of predictive models in the future.

UNIT - IV   **20 Hrs**

The Predictive Analytics Process: Project initiation - Project requirements - Is predictive analytics the right tool for the job? - Model building and business evaluation – Implementation - Monitoring and redevelopment - How long should a predictive analytics project take? **How to Build a Predictive Model** : Exploring the data landscape - Sampling and shaping the development sample - Data preparation (data cleaning) - Creating derived data - Understanding the data - Preliminary variable selection (data reduction) - Pre-processing (data transformation) - Model construction (modeling) - *Validation: Selling models into the business - The rise of the regulator*.

UNIT – V   **18 Hrs**

Text Mining and Social Network Analysis : Text mining - Using text analytics to create predictor variables - Within document predictors - Sentiment analysis - Across document predictors - Social network analysis - Mapping a social network. **Hardware, Software and All that Jazz** : Relational databases – Hadoop - The limitations of Hadoop - *Do I need a Big Data solution to do predictive analytics?* - Software for predictive analytics.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

   Steven Finlay, *Predictive Analytics, Data Mining and Big Data: Myths,*

   Misconceptions and Methods 1st Edition Macmillan Publishers Limited 2014.

REFERENCE BOOKS

1. **Chuck Lam** *Hadoop In Action*. 1st Edition Manning Publication. USA 2012.

2**. Alan Gates**.. *Programming Pig*. 1st Edition O'Reilly Media. USA 2011.

3. **Jimmy Lin and Chris Dye,** *Data-Intensive Text Processing with MapReduce.*

   1st Edition. Morgan And Claypool. USA 2010.

Skill Based Subject III: Image Editing And Animation Tools – Lab

Instructional Hrs: 45   **Sub. Code:16CSUSP03/16CAUSP03**

                                                                    /16ITUSP03/16CTUSPO3

Max. Marks: CIA -40; ESE -60   **Credits: 3**

Image Editing Tool

1. Design a greeting card for birthday using different text effects.
2. Design the front page of the college calendar using gradient.
3. Create a pattern using pattern stamp tool & clone stamp tool.
4. Create a digital drawing.
5. Design a web page layout.

Animation Tool

1. Perform simple text effect animation.
2. Create an animation using morphology.
3. Create a scene like a tree with rising sun and animate the sun.
4. Design a butterfly and make it fly.
5. Implement walking stick man.

B.Sc .,IT 2016-2017 onwards

Core Paper XIII: ASP.NET

Instructional Hrs. : 75   **Sub. Code : 08ITUC613**

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: To enable the students know the concepts of .NET programming .

UNIT I   **15 Hrs.**

What is .NET?-Introducing Visual studio 2005 - visual studio2005 integrated development environment-**ASP.NET essentials:** Introduction to ASP.NET- benefits of ASP.NET-What's new in ASP.NET-Introducing ASP.NET IDE-**Standard controls:** Introducing controls-*Introduction to Standard controls*-Label control-Text box control – Button control.

UNIT II   **15 Hrs.**

Radiobutton control - **Navigation controls:** Introduction to navigation control-Sitemappath control - Menu control- Tree view control-validation control:Introduction to validation control - *base validator class* - Required fieldvalidator control - Rangevalidator control- RegularExpression Validator control-Comparevalidator control - Customvalidator control.

UNIT III   **15 Hrs.**

Working with databases: What are databases?-Working with ADO.NET-Overview of ADO.NET objects-Basic SQL Statements-ASP.NET data display controls-ASP.NET Data source controls-*Accessing Data with server explorer*-creating a web application using data display controls.

UNIT IV   **15 Hrs.**

Introduction to visual c# 2005: Introduction- Features of visual c# 2005-Creating visual c# 2005 applications-Keywords-Identifiers-Data types-Variables- Scope of variables-Constants-Type Conversion

– *operators* -operator precedence and associativity-Punctuators-Expressions-Control statements-loops-Intrupting loops using Jump Statements.

UNIT V   **15 Hrs.**

Label, TextBox, Button, ComboBox and ListBox Controls: Introduction- Label control - TextBox control-Button control- ComboBox control-ListBox control- **CheckBox, RadioButton and GroupBox control:** CheckBox control-RadioButton control- GroupBox control-Working with ADO.NET-Overview of ADO.NET Objects-*DataGridView Control*-Accessing Data using Server Explorer-Creating a new data connection- Accessing Data using Data Adapter and datasets-Previewing Data from Data Adapters-connecting to an MS Jet Database

Note : Self study topics are denoted in *Italics*

TEXT BOOK

   Vikas Gupta, *Comdex .NET Programming***,** Dreamtech press 2007.

REFERENCE BOOKS

1. **Matt J.Crouch** , *ASP.NET and VB.NET Programming*, Pearson Education, 2002.

2. **Mridula Pariheretal**, *ASP.NET Bibile*, Wiley Dreamtech India (P) Ltd., 2006.

Core Paper XIV: Computer Graphics and Multimedia

Instructional Hrs: 75   **Sub. Code: 08ITUC614**

Max. Marks: CIA -25; ESE -75   **Credits: 4**

Objective: Enable the students to learn graphics and multimedia fundamentals.

UNIT I   **15 Hrs.**

A Survey of Computer Graphics: Computer Aided Design – Education and Training – Image processing – Graphical User Interface. **Overview of graphics System:** Video Display Devices – Refresh Cathode – Ray Tubes – Color CRT Monitors - Direct View Storage Tubes – Flat-Panel Displays. **Input Devices:** Keyboards – Mouse – Track Ball – Joystick – *Image Scanners* – Light Pens – Hard-Copy Devices.

UNIT II   **15 Hrs.**

Output Primitives: Points and Lines - Line Drawing Algorithms: DDA Algorithm – Bresenham's Line Algorithm – Circle-Generation Algorithms. **Two Dimensional Transformation:** Translation – Rotation – Scaling – reflection – Shear – Matrix Representations – composite Transformations (Translation, Scaling, Rotation) – General Pivot – *Point Rotation* – General Fixed Print Scaling.

UNIT III   **15 Hrs.**

Two Dimensional Viewing: The Viewing Pipeline – Window – To-View Port Coordinate Transformation. **Clipping Operations:** *Point Clipping* – Line Clipping (Cohen-Sutherland) – Polygon Clipping (Sutherland-Hodgeman) – Text Clipping.

UNIT IV   **15 Hrs.**

What is Multimedia – Introduction to Making Multimedia – *Multimedia Skills* – Text – Sound.

B.Sc .,IT 2016-2017 onwards

UNIT V   **15 Hrs.**

Images – Animation – Video – Multimedia Authoring Tools.

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Donald Hearn and M.Pauline Baker**, *Computer Graphics–C Version*, Second Edition, Pearson Education Publish, Sixth Indian, 2004 [UNIT I, II, III].
2. **Tay Vaughan**, *Multimedia: Making it Work*, , Tata McCraw-Hill, 6th Edition 2004 . [UNIT IV, V].

REFERENCE BOOKS

1. **Ralf Steinmetz Klara Nahrstedt,** *Multimedia: Computing, Communications and*

 Applications, Pearson Education, 1st Edition 2006.

2. **William M.Newman and Robert F. Sproull**, *Principles of Intractive Computer*

 Graphics, TMH Buf.Co.Ltd, 2nd Edition 2006.

SEMESTER VI

Practical VI: Computer Graphics and Multimedia Lab

Instructional Hrs: 75   **Sub. Code: 08ITUCP06**

Max. Marks: CIA -40; ESE -60   **Credits: 3**

Objective: To enable the students understand the concepts of Computer Graphics and

       Multimedia using C and Photoshop .

1. Write a Program to draw a line using Bresenham's method.
2. Write a Program to perform basic transformations (Translation, Rotation and Scaling).
3. Write a Program to reflect and shear a given object.
4. Write a Program to draw a circle using midpoint circle algorithm.
5. Write a Program for clipping a line.
6. Write a Program for clipping a given polygon.
7. Create an image and apply various shading effects.
8. Scan an image and apply various gradient tool effects with texture.
9. Create a web page with still image and an animated image.
10. Create an animation for rolling ball bouncing with random co-efficient.
11. Perform frame by frame morphing.
12. Create a website for a music magazine with at least 5 audio clips, put one audio control to play back the clips.

ELECTIVES FOR SIXTH SEMESTER

Elective II: E2.1. Internet of Things

Instructional Hrs: 90   **Sub. Code: 15CSUE622/15CAUE632/15ITUE61215CTUE622/**

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective: To learn IoT concepts and technologies.

UNIT – I   **14 Hrs**

Introduction – Concepts behind the Internet of Things: The IoT paradigm- Smart objects-Bits and atoms-Goal orientation-Convergence of technologies, Internet in general and Internet of Things.

UNIT - II   **18 Hrs**

Technologies behind the Internet of Things: RFID + NFC - Wireless networks + WSN - RTLS + GPS-Agents + Multi agent systems- layers-protocols-packets- services- performance parameters of a packet network as well as applications such as web- Peer-to-peer- sensor networks, and multimedia.

UNIT - III   **20 Hrs**

Creative thinking techniques : Modifications - Combination scenarios - Breaking assumptions - Solving problems, Transport services: TCP, UDP, socket programming-Network layer: forwarding & routing algorithms (Link, DV), IP-addresses, DNS, NAT, and routers-Local Area Networks, MAC level, link protocols such as: point-to-point protocols, Ethernet, WiFi 802.11, cellular internet access, and Machine-to-machine.

UNIT – IV   **20 Hrs**

Mobile Networking: Roaming and handoffs-mobile IP- and ad hoc and infrastructure less networks. Realtime networking: soft and real time- quality of service/information- resource reservation and scheduling and performance measurements.

UNIT – V   **18 Hrs**

IoT: Overview, applications, potential & challenges, and architecture. IoT examples: Case studies, e.g. sensor body-area-network and control of a smart home.

B.Sc .,IT 2016-2017 onwards

TEXT BOOK

Lu Yan , Yan Zhang , Laurence T. Yang , Huansheng Ning,*The Internet of Things:* From RFID to the Next-Generation Pervasive Networked Systems 2008.

REFERENCE BOOK

Kurose James F., Ross Keith W. *Computer networking*: a top-down approach 5th

Edition Boston, Mass Pearson Co 2010.

Elective II: E2.2. Soft Computing

Instructional Hrs: 90   **Sub. Code: 08ITUE622**

Max. Marks: CIA -25; ESE -75   **Credits: 5**

Objective: To enable the students understand the concepts of Neural Networks,

Fuzzy logic and Genetic algorithms.

UNIT I   **18 Hrs.** Introduction to Artificial   Introduction to artificial Intelligence Systems – **Fundamentals of Neural Networks**: Basic Concepts of Neural Networks – Human Bran – Modal of an Artificial Neuron – Neural Network Architectures – Characteristics of Neural Network – Learning Methods – *Taxonomy of Neural Network Architectures* – History of Neural Network Research – Early Neural Network Architectures – Some Application Domains.

UNIT II   **18 Hrs.**

Back propagation Networks: Architecture of a Back Propagation Network – Back Propagation Learning – Illustration – Applications – Effect of Tuning Parameter of the Back Propagation Neural Network – Selection of Various Parameters in BPN – *Variations of Standard Back Propagation Algorithm* – Research Directions.

UNIT III   **18 Hrs.**

Fuzzy Set Theory: Fuzzy Versus Crisp – Crisp Sets – Fuzzy Sets – *Crisp Relations* – Fuzzy Relations.

UNIT IV   **18 Hrs.**

Fuzzy System: Crisp Logic – Predicate Logic – Fuzzy Logic – Fuzzy Rule Based System – *Defuzzification Methods* – Applications.

UNIT V   **18 Hrs.**

Fundamentals of Genetic Algorithms: History of Genetic Algorithms – Basic Concepts – Creation of Off Springs – *Working Principle* – Encoding – Fitness Function – Reproduction.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

  Rajasekaran S, Vijalakshmi Pai G.A, *Neural Networks, Fuzzy Logic, and*

  Genetic   Algorithms, Synthesis and Applications, Prentice-Hall of India Private

  Limited, New Delhi, 2005.

Elective-II: E2.3. Mobile Computing

Instructional Hrs: 90   **Sub. Code : 09ITUE632/ 11CTUE612**

Max. Marks : CIA -25; ESE -75   **Credits: 5**

Objective : To enable the students understand the concepts of GSM, GPRS and

WIFI.

UNIT I   **18 Hrs.**

Introduction : Mobility of Bits and Bytes – Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – *Middleware and Gateways* – Application and services – Developing Mobile computer Applications – security in mobile computing – Standards – Why is it necessary – Standard bodies. MOBILE **COMPUTING ARCHITECTURE**: History of computers and Internet – Architecture for mobile computing – Three – tier architecture – Design considerations for mobile computing – Mobile computing through Internet – Making exiting application mobile enabled.

UNIT II   **18 Hrs.**

Mobile Computing Through Telephony: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – *IVR Application* – Voice XML – TAPI

UNIT III   **18 Hrs.**

Emerging Technologies: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 Java Card. GSM: Global System for mobile communications – *GSM Architecture* – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM-GSM Frequency allocations – Authentication and Security SMS

UNIT IV   **18 Hrs.**

GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Application for GPRS – Limitations – Billing and Charging. **WAP:** MMS – *GPRS Applications*

B.Sc .,IT 2016-2017 onwards

UNIT V   **18 Hrs.**

CDMA and 3G: Spread spectrum technology – IS 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802. II standards Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile ad hoc networks and sensor networks – *Wireless LAN Security WiFi vs. 3G.*

Note : Self study topics are denoted in *Italics*

TEXT BOOK

   Asoke K Talukder, Roopa R Yavagal, *Mobile Computing*, TMH, 2005.

REFERENCE BOOKS

1. **Jeyasri Arokiamary.V**, *Mobile Computing*, Technical publication, 1st Edition,

   2007.

2. **Naseer Hussain**, *Mobile Computing*, Rajalaxmi Publishers, 1st Edition, 2003.

Skill Based Subject IV: DTP Design Tools (Pagemaker and Coreldraw) - Lab

Instructional Hrs: 45   **Sub. Code: 11ITUSP04**

Max. Marks: CIA -40; ESE -60   **Credits: 3**

Objective: To gain practical knowledge in DTP design using Pagemaker and CorelDraw.

PageMaker

1. Prepare a Bio-data. Apply font size, tabs, alignment, indentation and Text wrap.
2. Create a greeting card for New Year.
3. Create an Advertisement for a job in well-known form.
4. Create a Newspaper Report.
5. Create a Document by importing graphic image from Clip Art.

CorelDraw

6. Create a Document. Apply different formats to design it.
7. Combine a Text in the word processor and the graphic in Corel draw by using Print Merge.

8. Create a Nested shapes. Apply rotation, lock and fill color options.
9. Create any design using Line Drawing Method.
10. Create an Advertisement using an object, with combine and group options.

1. Green Computing

Sub. Code: 14ITUSL03

Max. Marks: 100   **Credits: 5**

Objective: To learn the measures in protecting environment through proper usage of

Computers and components.

UNIT I

What Is Green Computing?: Knowing What Green Computing Means - Getting Started with Green Computing - Speaking Green Jargon. **Checking Out Your Carbon Footprint**: Knowing Your Carbon Footprint ABCs - Facing the Facts - Reducing Your Footprint. **Assessing What You've Got**: Starting an Inventory of Your Computing Equipment - Understanding How You Use Devices - Working Better with What You Have- Developing computer habits that save energy - Making the Case for a New Purchase.

UNIT II

Giving Your Computer a Green Makeover:Weighing Your Makeover Possibilities - Shrinking the Elephant on Your Desktop - Gaming and More with a Greener Video Card -Adding Memory without Ginseng - What's a Terabyte among Friends? Improving Your Laptop Battery - Greening Your Power Supply. **Buying a Green Computer**: Understanding what makes a computer green- Matching a computer to your needs- Researching Your Options - Checking Out Small, Green, Niche Computers - Making Your Purchase.

UNIT III

Choosing Earth-Friendly Peripherals: Planning Your Purchases of Green Peripherals - Sharing Peripherals - Picking Printers - Seeing Some Specialty Drives - Selecting Keyboards and Mice - Calling Router Rooter - Making the Purchase — and What to Do Afterward.

B.Sc .,IT 2016-2017 onwards

UNIT IV

Recycling Your Computer: Facing the e-Waste Facts - Exporting the e-Waste Problem -Seeing Reasons to Recycle Computers - Planning Your Computer's Retirement - Wiping Your System Clean - Finding Great New Uses for an Old Computer - Going Back to the Source (Almost) - Recycling Computer Supplies, Too - Taking Local Action to Clean Up Global Computer Waste.

UNIT V

Print Less, Breathe More - Seamless Sharing across Systems: Sharing at Home - Benefits of networking - Types of networks - Setting Up a Home Network -Securing the wireless airwaves - Sharing the Easy Stuff - Sharing printers - Sharing media files - Figuring out what it is: hardware, software, or both? - Keeping Your Footprint Low at Home - Working with backups - Cleaning things up- Monitoring your resources **Ten Best Ways to Make Your Computer Greener**

TEXT BOOK

   Woody Leonhard and Katherine Murray, *Green Home Computing for Dummies,* Wiley Publishing, Inc.

REFERENCE BOOKS

1. **John Lamb**, *The Greening of IT* , IBM Press, 2009.
2. **Jason Harris,** Green *computing and Green IT Best Practices.*

3. PYTHON

Sub.Code: 14CSUSL15

Max.Marks:100   **Credits: 5**

Objective: To learn and develop programs in Python through free online resources.

UNIT I

Getting started with ipython - Using the plot command interactively - Embellishing a plot **-**Saving plots **-** Multiple plots **-** Additional features of IPython.

UNIT II

Loading data from files - Plotting the data - Other types of plots - Getting started with sage notebook - Getting started with symbolics.

UNIT III

Using Sage - Using sage to teach - Getting started with lists - Getting started with for - Getting started with strings - Getting started with files.

UNIT - IV

Parsing data – Statistics - Getting started with arrays - Accessing parts of arrays – Matrices

Least square fit - [Basic data types and operators](#) - I O- Conditionals.

UNIT – V

Loops - Manipulating lists - Manipulating strings - Getting started with tuples – Dictionaries- Sets - Getting started with functions - Advanced features of functions - Using python modules - Writing python scripts - Testing and debugging.

Material : Video Tutorials of Spoken Tutorial, IIT Bombay

B.Sc .,IT 2016-2017 onwards

4. PHP and My SQL

Sub.Code: 14CSUSL25

Max.Marks:100   **Credits: 5**

Objective: To learn and develop programs in PHP and MySQL through free online resources.

UNIT I

XAMPP in Windows - XAMPP in Linux - Echo Function - Variables in PHP – IF Statement - Switch Statement - Arithmetic Operators - Comparison Operators - Logical Operators -   Arrays - Multi Dimensional Arrays.

UNIT II

Loops While Statement - Loops Do While Statement - Loops For Statement - Loops For..each Statement - Functions Basic - Functions Advanced - GET Variable - POST Variable - Embedding PHP.

UNIT III

Common Way to Display HTML - Common Errors Part 1, 2 & 3 - MySQL Part 1,2,3,4,5,6,7 & 8 - Simple Visitor Counter.

UNIT IV

PHP String Functions Part 1 & 2 - File Upload Part 1& 2 - Cookies Part 1 & 2 – Sessions - MD5 Encryption.

UNIT V

Sending Email Part 1, 2 & 3 - Display Images from a Directory - User Login Part 1, 2 & 3 - User Password Change Part 1, 2 & 3 - User Registration Part 1, 2, 3, 4, 5 & 6.

Material: Video Tutorials of Spoken Tutorial, IIT Bombay

B.Sc .,IT 2016-2017 onwards